

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

REC'D 22 JUL 2004

WIPO PCT

Applicant's or agent's file reference TAB/59710/050	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)
International application No. PCT/GB 03/01768	International filing date (day/month/year) 24.04.2003	Priority date (day/month/year) 25.04.2002
International Patent Classification (IPC) or both national classification and IPC B42D15/00		
Applicant DE LA RUE INTERNATIONAL LIMITED et al.		

<p>1. This International preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 5 sheets.</p>
<p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the opinion II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 15.09.2003	Date of completion of this report 21.07.2004
Name and mailing address of the International preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	
Authorized Officer Achermann, D Telephone No. +49 89 2399-2029	



**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB 03/01768

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-7, 9, 10, 13-17	as originally filed
8, 11, 12	received on 25.03.2004 with letter of 22.03.2004

Claims, Numbers

7-14, 15 (part)	as originally filed
1-6, 15 (part), 16-22	received on 25.03.2004 with letter of 22.03.2004

Drawings, Sheets

1/8-8/8	as originally filed
---------	---------------------

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.:
- the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/GB 03/01768

5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-22
Inventive step (IS)	Yes: Claims	
	No: Claims	1-22
Industrial applicability (IA)	Yes: Claims	1-22
	No: Claims	

2. Citations and explanations

see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB03/01768

Re item I:

- 1 The amendments filed with the letter dated 25.03.2004 introduce subject-matter which extends beyond the content of the application as filed, contrary to Article 34(2)(b) PCT. The amendments concerned are the following:
 - 1.1 In claim 1 "between 1 and 50% by weight of magnetic material". On pages 11 and 12 as originally filed two intervals are disclosed: 0.1-50% and 1-30%. The interval 1-50% is not originally disclosed.

The amendments on pages 11 and 12 are also not allowable, for the same reason.

- 1.2 As the change on page 8 from "aluminum nickel cobalt" to "*iron* aluminum nickel cobalt" is not directly and unambiguously derivable from the documents originally filed, this amendment contravenes Art. 34(2)(b) PCT. This change cannot be regarded as a correction as it is not evident that an error has occurred (nickel or cobalt are good magnetic materials), and there would be many different ways of correcting.

Re Item V:

- 2 Reference is made to the following document:

D1: FR-A-2771111.
- 3 The subject-matter of claims 1-22 is not new (Article 33(2) PCT).
 - 3.1 In the following the examination has been made as if the amendment in claim 1 read "between 1 and 30%" instead of "between 1 and 50%" (see §1 above).

D1 discloses (see whole document) that magnetic particles in a low concentration and a small enough size permit layers in which such magnetic particles are incorporated to remain transparent. Magnetic particles can be incorporated in security documents (eg wrapping plastic), security elements (eg holograms), protection varnishes, all of which can have indicia printed or demetallised.

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB03/01768

In D1 on page 7 lines 9-13 it is said that the magnetic layer should contain a quantity of magnetic material smaller or equal to 1% by weight. The value 1% is explicitly part of the disclosed interval. Therefore the feature [1% , 30%] is anticipated by the disclosure [... , 1%].

Therefore the subject-matter of claim 1 is known from D1.

It is to be noted that the interval]1% , 30%] (i.e. without the value 1%) would not be anticipated by D1. But this interval is not originally disclosed in the present application.

It is further to be remarked that magnetic layers comprising more than 1% of magnetic material, used in security substrates as in claim 1, are very common, see for instance EP-A-610 917 and EP-A- 310 707, both cited in D1.

3.2 The subject-matter of claims 2-22 is known from D1.

-8-

The invention requires the use of hard magnetic materials, namely those which have a magnetic remenence in the absence of an applied magnetic field, and preferably a coercivity of greater than 100
5 oersteds.

The hard magnetic particles may be black iron oxide, gamma iron oxide, cobalt treated gamma iron oxide, barium or strontium ferrites, metallic iron, 10 metallic nickel, metallic cobalt, samarium cobalt, neodymium iron boron or iron aluminum nickel cobalt. Suitable magnetic materials are commercially available from Magnox Inc., Pfizer Pigments Inc or Toda Kogyo Corp., and suitable varnishes include 1462 from 15 Luminescence, VHL 31534 from Sun Chemicals or 31833XSN, 20784XSN and 90838XSN; all from Coates Lorilleux. The carrier layer (1) may be PET, BOPP or another suitable polymer.

20 A surprising benefit lies in the provision of a distinctive colour or reflection by varying the coat weights of the magnetic material, whilst maintaining the transparency of the magnetic layer (2). This surprising effect can be enhanced or reduced dependent upon 25 material type and coating thickness to suit the application.

30 Alternatively, as shown in Fig. 4, the magnetic particles may be incorporated in the polymer layer (6) itself. From herein it should be appreciated that the use of a coated polymer layer (1) or a polymer layer (6) containing the magnetic particles are interchangeable within all the described embodiments.

35 The substrate is provided with indicia formed from a plurality of opaque and non-opaque regions, which may be metallised, demetallised, printed or

-11-

In a first example, as shown in Fig. 1, the polymer carrier (1) is provided by a 12 μm standard polyester film which is coated at a coat weight of 2gsm with a varnish (2) containing 1-50%, more preferably 1-30%, by weight of magnetic material. The lower range of loading can be used where more sophisticated detection equipment is available. Onto this carrier (1) a metallic reflection-enhancing layer, such as aluminium, is applied, although other metals such as copper could be used. This metallic layer is printed with a resist layer defining indicia and is then exposed to a caustic etch solution which removes the metal not protected by the resist. The caustic solution is washed away to reveal metallised regions (3) and demetallised regions (4), defining indicia. Alternatively any of the known methods for demetallisation could be used. An additional layer (5) of 12 μm polyester may then be applied using a layer of adhesive to improve durability of the substrate. The thus formed substrate may then be slit in register to form security threads for inclusion into paper or polymer as described in EP-A-59056 and GB-A-0111452.9 respectively. Where the substrate is used to form security threads a further layer of adhesive is preferably applied to one or both sides of the substrate to ensure secure location of the thread within a sheet of paper. In this, and other examples, further barrier layers are preferably provided on either side of the metallic layer to prevent environmental attack.

Potential alternative constructions are shown in figures 2 and 3. In both these examples a metallised polymer film e.g. 12 μm metallised Type S from DuPont is demetallised as described above prior to application of the magnetic varnish layer. Figure 2 shows the varnish layer applied onto the demetallised surface and figure 3 shows the varnish layer applied on the opposite side to the demetallised layer.

-12-

Example 2

5 In a second example, as shown in Fig. 5, a layer of a pressure sensitive or hot melt adhesive (7) is subsequently applied to either of the polymer layers (1,5) of the substrate of Example 1, and strips of the substrate may be used as a tear tape for secure packaging.

10 Figures 6 and 7 show alternative constructions with the varnish layer applied onto the demetallised layer on the opposite side of the demetallised layer.

15 Example 3

20 As a further alternative a layer of pressure sensitive or hot melt adhesive (7) may be applied to the partially metallised surface (3,4) as shown in Fig. 8. This provides the additional benefit that tapes made from the substrate now show some tamper evident properties. When such a tape is removed from the packaging or substrate the metal region (3) will be irreversibly removed to clearly illustrate tampering. A 25 suitable pressure sensitive adhesive would be Indatex SE 5219 (applied at between 1gsm-20gsm, and more preferably at 8gsm).

30 Figure 9 shows an alternative construction with the varnish layer applied to the opposite side of the demetallised layer.

Example 4

35 In this example the magnetic particles have been included as part of the polymer carrier layer (6), as shown in Fig. 4. In a typical example, 1-50% by weight of magnetic material would be included in the

-18-

CLAIMS:

5 1. A security substrate comprising a transparent polymer carrier layer bearing indicia formed from a plurality of opaque and non-opaque regions and a transparent magnetic layer supported by the carrier layer containing a distribution of particles of a hard magnetic material of a size and distributed in a concentration at which the magnetic layer remains transparent, characterised in that the magnetic layer contains between 1 and 50% by weight of magnetic material.

10

15 2. A security substrate as claimed in claim 1 in which the transparent magnetic layer comprises a varnish in which are suspended the magnetic particles.

20

3. A security substrate as claimed in claims 1 or 2 in which the transparent magnetic layer lies between the carrier layer and the indicia.

25

4. A security substrate as claimed in any one of the preceding claims in which the indicia are formed on the carrier layer and the transparent magnetic layer covers the indicia.

30

5. A security substrate comprising a transparent polymer carrier layer, bearing indicia formed from a plurality of opaque and non-opaque regions, which carrier layer contains a distribution of particles of a hard magnetic material of a size and distributed in a concentration at which the carrier layer remains transparent.

35

6. A security substrate as claimed in any one of the preceding claims further comprising an additional layer of a transparent polymer laminated to the magnetic layer and/or indicia.

-20-

regions.

5 16. A security substrate as claimed in any one of the preceding claims further comprising an optically variable device.

10 17. A security substrate as claimed in claim 16 in which the optically variable device is formed by embossing a layer of embossing lacquer.

15 18. A security substrate as claimed in claim 16 in which the embossing lacquer lies between the magnetic layer and the indicia.

20 19. A security substrate as claimed in claim 17 in which the embossing layer lies between the transparent magnetic layer and a layer of high refractive index.

25 20. A security substrate as claimed in claim 17 wherein the embossing layer overlies the indicia.

21. An elongate security element made by the step of slitting the substrate as claimed in any one of the preceding claims in register with the indicia.

30 22. A security document comprising a paper or polymer substrate incorporating a security thread as claimed in claim 21.